

Creating a New Model for Diversity in Scientific and Medical Research

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Oakland, CA – The global pandemic has highlighted many of the inequities in our health care system, with the virus hitting communities of color the hardest. That has led to calls for greater diversity, equity and inclusion at every level of scientific research and, ultimately, of medical care. A recently released article in the journal *Nature Cell Biology*, calls for "new models for basic and disease research that reflect diverse ancestral backgrounds and sex and ensure that diverse populations are included among donors and research participants."

The authors of the article are Dr. Maria T. Millan, CIRM's President & CEO; Rick Horwitz Senior Advisor and Executive Director, Emeritus, Allen Institute for Cell Science; Dr. Ekemini Riley, President, Coalition for Aligning Science; and Dr. Ruwanthi N. Gunawardane, Executive Director of the Allen Institute for Cell Science.

Dr. Maria Millan, CIRM's President & CEO, says we need to make these issues a part of everything we do. "At CIRM we have incorporated the principles of promoting diversity, equity and inclusion in our research funding programs, education programs and future programs. We believe this is essential to ensure that the therapies our support helps advance will reach all patients in need and in particular communities that are disproportionately affected and/or under-served."

The article highlights how, in addition to cultural, environmental, and socioeconomic factors, genetic factors also appear to play a role in the way disease affects different people. For example, 50 percent of people in South Asia have genetic traits that increases their risk for severe COVID-19, in contrast only 16 percent of Europeans have those traits.

But while some studies have shown how African American men are at greater risk for prostate cancer than white men, most of the research in this and other areas has been done on white populations of European ancestry. Efforts are already underway to change these disparities. For example, the National Institutes of Health (NIH) has sponsored the All of Us Research Program, which is inviting one million people across the U.S. to help build one of the most diverse health databases in history.

The article in *Nature Cell Biology* stresses the need to account for diversity at the individual molecular, cellular and tissue level. The authors make the point that diversity in those taking part in clinical trials is essential, but equally essential is that diverse biology is accounted for in the scientific work that leads to the development of potential therapies in order to increase the likelihood of success.

That's why the authors of the article say: "If we are to truly understand human biology, address health disparities, and personalize our treatments, we need to go beyond our important, ongoing efforts in addressing diversity and inclusion in the workforce and the delivery of healthcare. We need to improve the data we generate by including diverse populations among donors and research participants. This will require new models and tools for basic and disease research that more closely reflect the diversity of human tissues, across diverse donor backgrounds."

"Greater diversity in biological studies is not only the right thing to do, it is crucial to helping researchers make new discoveries that benefit everyone," said Ru Gunawardane, Executive Director of the Allen Institute for Cell Science.

To do this they propose creating "a suite" of research cells, such as human induced pluripotent stem cell (hiPSC) lines from a diverse group of individuals to reflect the racial, ethnic and gender composition of the population. Human iPSCs are cells taken from any tissue (usually skin or blood) from a child or adult that have been genetically modified to behave like an embryonic stem cell. As the name implies, these cells are pluripotent, which means that they can become any type of adult cell.

CIRM has already created one version of what this suite would look like, through its iPSC Repository, a collection of more than 2,600 hiPSCs from individuals of diverse ancestries, including African, Hispanic, Native American, East and South Asian, and European. The Allen Institute for Cell Science also has a collection that could serve as a model for this kind of repository. Its collection of over 50 hiPSC lines have been thoroughly analyzed on both a genomic and biological level and could also be broken down to include diversity in donor ethnicity and sex.

Currently researchers use cells from different lines and often follow very different procedures in using them, making it hard to compare

results from one study to another. Having a diverse and well defined collection of research cells and cell models that are created by standardized procedures, could make it easier to compare results from different studies and share knowledge within the scientific community. By incorporating diversity in the very early stages of scientific research, the scientists and therapy developers gain a more complete picture of the biology disease and potential treatments.

About CIRM

At CIRM, we never forget that we were created by the people of California to accelerate stem cell treatments to patients with unmet medical needs, and act with a sense of urgency to succeed in that mission.

To meet this challenge, our team of highly trained and experienced professionals actively partners with both academia and industry in a hands-on, entrepreneurial environment to fast track the development of today's most promising stem cell technologies.

With \$5.5 billion in funding and more than 150 active stem cell programs in our portfolio, CIRM is the world's largest institution dedicated to helping people by bringing the future of cellular medicine closer to reality.

For more information go to www.cirm.ca.gov

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